

the application is respectfully requested in view of the above amendments and the remarks set forth below.

Allowable Subject Matter

Applicants thank the Examiner for the indication that claims 1-4 and 6 are allowed. Because the remainder of the pending claims all now ultimately depend from claim 1, it is respectfully submitted that these claims are allowable for at least the same reasons as claim 1.

Election/Restriction

The Office Action indicates that claims 5 and 7 are directed to non-elected subject matter and have been withdrawn from consideration. The Office Action asserts that present claim 1 "is not generic as it reads specifically on elected Species D, as depicted by Figure 10 of the application" (see the last sentence in paragraph #1 on page 2 of the Office Action).

However, Applicants respectfully note that the March 26, 2003, Patent Office Paper Number 6 containing the Restriction Requirement clearly states that claim 1 appears to be generic. The June 7, 2002, Patent Office Paper Number 9 again states that claim 1 is generic.

Additionally, as noted in Section 806.04(d) the U.S. Patent and Trademark Office Manual of Patent Examining Procedure (MPEP), "[o]nce a claim that is determined to be generic is allowed, all of the claims drawn to species in addition to the elected species which include all the limitations of the generic claim will ordinarily be obviously allowable

in view of the allowance of the generic claim, since the additional species will depend thereon or otherwise include all of the limitations thereof.”

Applicants also respectfully note that claim 5 depends from allowed claim 1 and is directed to an embodiment of the humidifier of claim 1 where “an approximately central portion of said housing in the lengthwise direction is constricted toward the central direction of the axis thereof. Applicants believe that claim 1 is clearly generic to present claim 5. In particular, as claim 1 makes no requirement regarding a constriction or a lack of a constriction toward the central direction of the axis, claim 1 must be generic to claim 5. Thus, Applicants respectfully submit that withdrawn claim 5 should clearly be rejoined and examined with claims 1-4 and 6.

Claim 7 is directed to a fuel cell having the humidifier according to any of claims 1-6. Thus, any fuel cell according to claim 7 must include a humidifier meeting the limitations of one or more of claims 1-6. Thus, Applicants respectfully submit that claims 1-6 are generic to claim 7 and thus should also be rejoined with claims 1-4 and 6.

Section 112, Second Paragraph, Rejection

The Office Action rejects claims 8 and 9 under 35 U.S.C. § 112, second paragraph, as being indefinite for containing asserted informalities. In particular, the Office Action asserts that “it is unclear as to what applicant intends to claim with respect to the recitation of the phrase ‘a diameter longer than that of the hollow fiber membrane’” (see the last sentence in paragraph #2 on page 2 of the Office Action).

Applicants respectfully submit that it would be clear to one of ordinary skill in the art that the terminology refers to the inner diameter of the bypass tube being larger than that of the hollow fiber membrane, as is discussed in more detail at page 14, lines 14+ of the present specification. However, in order to expedite prosecution of this application, Applicants have amended claims 8 and 9 such that the terminology if "longer" is changed to --larger--.

Reconsideration and withdrawal of the rejection of claims 8 and 9 under 35 U.S.C. § 112, second paragraph, are respectfully requested.

Section 103 Rejection

The Office Action rejects claims 8 and 9 under 35 U.S.C. § 103(a) as being obvious over either of Krueger et al. (U.S. Patent No. 4,666,469) or Nakanishi et al. (U.S. Patent No. 6,210,464 B1), taken in view of applicant's admitted prior art as depicted by Figure 14 of the instant application. This rejection is traversed as it may apply to the amended claims 8 and 9.

In the claims amendment, no new issue is added, because content from claim 1 and functions therefore are only added to claims 8 and 9. The addition of the functional description in this amendment are described in Applicants' December 9, 2002 Amendment.

In the known humidification process, disclosed for example in AAPA, the gas flowing outside the membranes is introduced and discharged from a portion near the central portion of the lengthwise direction of a housing and thus, the substantial amount of the gas only flows the central portion of the lengthwise direction of the housing.

Krueger and Nakanishi disclose humidification processes which utilizes a membrane module processing a bypass channel wherein gas is subjected to flow from an approximate central portion of the cross-lengthwise direction (radius direction) to outside the membranes via the bypass channel. However, in these humidification processes, all the gas which will flow outside the membranes is introduced into the bypass channel, and the gas exiting the bypass channel is discharged from only one exhaust channel (not plurality). In such cases, the gas flows linearly toward the only one outlet of the housing, and at portions far from the outlet, the gas flows the hollow fiber membranes near the inner surface of the housing only with difficulty. For this reason, in these humidification processes, the gas cannot spread over whole areas of outside the membranes.

In contrast, the humidification process of amended claim 8, a part of the gas flowing outside the membranes is subjected to flow outside of the membrane from a plurality of the outlets possessed by the bypass channel, and the remaining part of the gas flowing outside the membranes is directly supplied to outside the membranes, whereby the gas can be spread over the entire space, with reducing the phenomenon the gas flows the hollow fiber membranes near the inner surface of the housing and the hollow fiber membranes placed near the bypass channel only with difficulty. This process can carry out a moisture exchange between said gas flowing outside the hollow fiber membranes and the gas flowing inside the hollow fiber membranes with a high efficiency.

In the humidification process of amended claim 9, a whole of the gas is introduced from one end of said bypass channel to the bypass channel, the gas

introduced into the bypass channel then flows outside the hollow membrane module from the plurality of outlets placed along the lengthwise direction of the entire length of the bypass channel. This can also make it possible to be spread over the entire area of outside the hollow fiber membranes and to carry out a moisture exchange between the gases.

As described above, the humidification processes in claims 8 and 9 are distinguished from the cited references in the manner of gas flowing and have great merits over these references. Consequently, the humidification processes are not taught, suggested or introduced from these cited references, and even if these references are combined, the present invention would not have been made. Reconsideration of the rejection of claims 8 and 9 under 35 U.S.C. § 103(a) are thus respectfully requested.

Conclusion

In view of the above amendments and remarks, Applicants respectfully submit that this application is in condition for allowance. Favorable consideration and prompt allowance of the claims is earnestly solicited. Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned attorney at the telephone number listed below.

In the event this paper is not considered to be timely filed, Applicants respectfully petition for an appropriate extension of time. The Commissioner is authorized to charge

payment for any additional fees which may be required with respect to this paper to
Counsel's Deposit Account 01-2300, referring to client-matter number 106145-00016.

Respectfully submitted,

A handwritten signature in black ink, reading "Robert K. Carpenter". The signature is written in a cursive style with a horizontal line underneath the name.

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Attachment: Petition for Extension of Time

AMENDED CLAIMS 8 AND 9 MARKED-UP TO SHOW CHANGES

8. (Amended) A humidification process utilizing a hollow fiber membrane module comprising a plurality of water-permeable hollow fiber membranes placed along the lengthwise direction of a housing accommodated within the housing, in which gases each having a different moisture content flow inside and outside said hollow fiber membranes to carry out moisture exchange whereby the dry air having a low moisture content is humidified, said hollow fiber membrane module having a bypass channel with a diameter larger [longer] than that of the hollow fiber membrane formed on an approximately central portion of the cross-lengthwise direction of said housing along the lengthwise direction of said housing of said hollow fiber membrane module, and with a plurality of outlets placed along the lengthwise direction of the entire length of the bypass channel

said humidification process comprising:

introducing a part of one of said gases to flow in the bypass channel, while subjecting the remaining part of the gas to directly flow outside the hollow fiber [membrane] membranes;

subsequently subjecting said gas introduced into the bypass channel to flow outside the hollow [fiber] membrane[; and] module from said plurality of outlets placed along the lengthwise direction of the entire length of the bypass channel, to combine said gas having been introduced into the bypass channel with the remaining part of the gas, whereby said one of the gases is spread over the outside said hollow fiber membranes accommodated within said housing, and

carrying out a moisture exchange between said gas flowing outside the hollow fiber [membrane] membranes and said the gas flowing inside the hollow fiber [membrane] membranes.

9. (Amended) A humidification process utilizing a hollow fiber membrane module comprising a plurality of water-permeable hollow fiber membranes placed along the lengthwise direction of a housing accommodated within the housing, in which gases each having a different moisture content flow inside and outside said hollow fiber membranes to carry out moisture exchange whereby the dry air having a low moisture content is humidified, said hollow fiber membrane module having a bypass channel with a diameter larger [longer] than that of the hollow fiber membrane formed on an approximately central portion of the cross-lengthwise direction of said housing along the lengthwise direction of said housing of said hollow fiber membrane module and with a plurality of outlets placed along the lengthwise direction of the entire length of the bypass channel, and said housing having a plurality of outlet ports formed in a circumferential direction thereon,

said humidification process comprising:

introducing a whole of one of said gasses [gases to flow in] into the bypass channel from one end of said bypass channel;

subsequently subjecting said gas introduced into the bypass channel to flow outside the hollow [fiber] membrane module from said plurality of outlets placed along the lengthwise direction of the entire length of the bypass channel to be spread over the whole of outside said hollow fiber membranes.

discharging said one of gasses spread outside said hollow fiber membranes from said plurality of outlet ports formed in a circumferential direction thereon; and

carrying out a moisture exchange between said gas flowing outside the hollow fiber [membrane] membranes and the gas flowing inside the hollow fiber [membrane] membranes.

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